This invention relates to oat hullers in general and more specifically to a single unit combining both hulling and rolling operations whereby the oats are not only hulled but also flaked in a single operation.

Heretofore known machines have been used for hulling the green oats and a separate machine in a separate operation was required in order to roll the oats. Such machines necessitated a large initial investment and also required a large amount of space in order to accommodate the machines. When separate machines were used for hulling and flaking, an additional elevating mechanism was also usually required.

An object of the present invention is to provide a single machine incorporating both operations and which requires a small amount of floor space in contradistinction to previously known devices.

Another object of the present invention is to provide a combination of a huller and a flaker in which the huller is mounted directly on the flaker and in which the hulled oats are discharged directly into the flaking roll.

A further object of the present invention is to provide a combination unit in which the flaking rolls may be rendered inoperative or varied to give different size flakes as required without affecting the hulling operation.

Still a further object of the present invention is to provide a complete unit which will hull the oats, separate the hulls, dispose of the hulls and roll the oats to desired size in a single unit whereby additional equipment is unnecessary.

With the above and other objects in view which will appear as the description proceeds, my invention consists in the novel features herein set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings in which numerals of like character designate similar parts throughout the several views:

Figure 1 is a perspective view of the machine of the present invention;

Figure 2 is an end elevational view partially broken away;

Figure 3 is a longitudinal sectional view of the device taken on line 3—3 of Fig. 4; and

Figure 4 is a lateral sectional view through the machine taken on line 4—4 of Fig. 3.

In the drawings the entire combined unit is depicted in Figure 1 and generally comprises a hulling unit 10 and a rolling unit 11. The hulling unit is superimposed on the rolling unit and the hulled oats pass directly from the hulling unit into flaking rolls and thence the groats are moved while the hulls are discharged and those oats not hulled are returned to the hulling unit.

A hopper 12 is provided on the device into which the green oats are fed and they pass into the tube 13. A screw conveyor 14 in tube 13 is rotatably journaled in ball bearings and raises the oats through a bearing box 15 into the hulling chamber 16. Through the chamber 16 there extends a shaft 17 which is journaled in three double row flange ball bearings 18. Rotation of the shaft 17 is effected by means of pulley sheave 19 with which a drive belt, not shown, cooperates in association with a source of power of any desired type.

The hulling chamber 16 has a hulling head cap 20 which is bolted onto the hulling head or hulling chamber and which is also secured to the bearing box. In the top of tube 13 there is an opening through which the oats raised by conveyor 14 pass into bearing box 15. There is also an opening 21 in the center of the head cap 20 through which the oats pass into the hulling chamber 16. The conveyor 14 extends only to the bottom of the bearing box 15 as seen in Figure 3 of the drawings.

Secured to shaft 17 in the hulling chamber 16 are two discs 22 and 23 having projections 24 thereon of rounded configuration adapted to provide a rolling action to the oats. An adjustable cylinder 25 is provided in the hulling chamber 16 which by means of handle 26 can be rotated. This cylinder 25 is corrugated thus forming a series of projections 27 on the inner face thereof which extend into the chamber 16. On the external surface of the chamber 16 a tapered slot through which a bolt is secured to handle 26 and to cylinder 25, extends. When handle 26 is slightly moved the cylinder 25 is axially moved in relation to disc 22 and the space between the projections 27 and 24 is consequently varied to suit the size of oats to be hulled for apparent reasons. The discs 22 and 23 in conjunction with cylinder 25 constitute the hulling surfaces or discs.

A center piece 28 is provided for supporting the center bearing 18. This center piece 28 has an opening therethrough between the hulling chamber 16 and the remainder of the unit 10.

A screw conveyor 29 is rotatably journaled in the device and is operated by means of pulley 30 and pulley 31 on shaft 17 with belts 32 or the like therebetween. The conveyor extends between the two end frames of the machine and through the opening in center piece 28 for conveying the oats therefrom after having been subjected to a hulling operation in chamber 16.

A fan 33 is mounted on shaft 17 for rotation
therewith and this fan creates an air draft on the hulled oats passing along conveyor 29 which draws the hulls from the grain and blows them into a hull bin.
The grain from which the hulls have been partially removed at this point fall into the Carter disc separating chamber 34. In this chamber a plurality of Carter discs 35 on shaft 36 mechanically separate the grouts from the remaining hulls and whole oats which have not been completely hulled the first time through the hulling head or chamber 16. Each of the Carter discs 35 has three spokes 37 (Figure 4) on each of which are mounted square pieces of sheet metal 38 which are bent to serve as an auger for conveying 15 grain in the chamber 34 back into conveyor 14. An opening 39 is provided for the return of the grain into conveyor 14 from chamber 34 by the pieces 38. The connection between chamber 34 and conveyor 14 from opening 39 is seen in dotted lines at 108 in Fig. 3. In this manner the unhulled oats are returned through the hulling chamber 16 a second time.

The Carter disc, as is well known, is a circular member having a large number of pockets on each side thereof approximately the exact size of an oat grain. When the disc is rotated each of the pockets become filled with an oat grain or hull lying in the bottom of the separating chamber. When a pocket rises into the air stream above the pool the air picks off the hull. The centrifugal action retains the grain in the pocket until it travels approximately 270° from the lower vertical. At this point the grain leaves the pocket and is thrown onto a baffle plate 40 below which are mounted the rolls as will be explained hereinafter. The baffle plate 40 can be used for directing the hulled oats into the loading chutes or outside of the rolling mechanism. This baffle plate enables the operator to obtain hulled and flaked oats or merely unhulled oats. When the grain is hulled only, the rollers can be shut off and the flaking unit is idle. The Carter discs 35 mounted on shaft 36 are driven by a continuous roller chain 65 (Figure 2) from a sprocket on the shaft on which conveyor 29 is mounted.

In order to control the flow of air to fan 33, an air damper 104 is provided which is pivotally mounted and biased to contact with stationary member 105 by spring 41. An adjustable tension between the hulling me"
5. A device for treating grain as claimed in claim 4 and including air inlet means to said separating means, and air draft control means for varying the intensity of air to said separating means.

6. A device for treating grain as claimed in claim 2, said flaking means comprising two rotatably mounted coating rollers positioned directly below and open to said hull and grain separating means and adapted to receive directly therefrom hulled grain for flaking, one said roller being movable toward and away from the other of said rollers for varying the pressure therebetween and for rendering said rollers inoperative.

JOHN K. ROSKAMP.

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